

QUEST

ADVENTURES IN THE WORLD OF SCIENCE

SECURITY

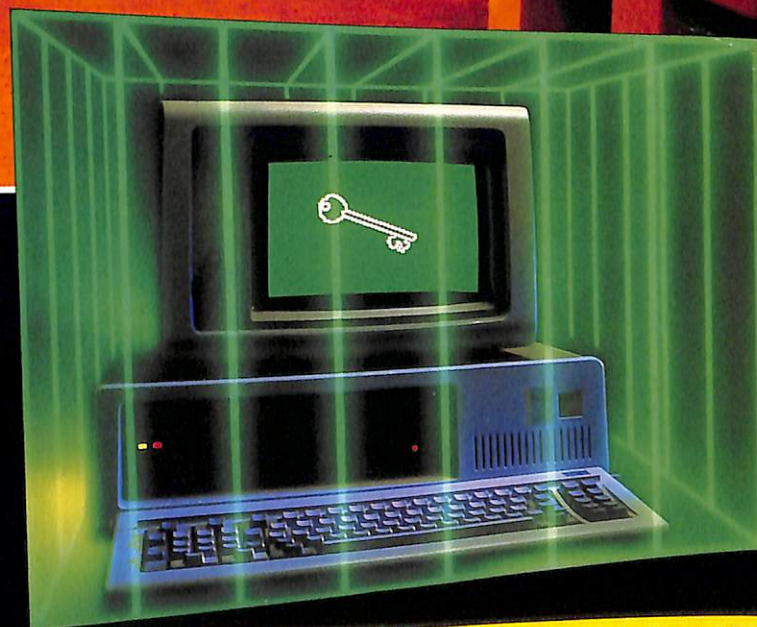
25

GIANT POSTER

THREE PROJECTS

FACT FILES ON:

- ▶ Combating computer crime
- ▶ Laser battle stations
- ▶ Armoured cars
- ▶ Surveillance systems
- ▶ The Martial Arts
- ▶ Fortifying borders
- ▶ Defending territory



MAKE AN ARMADILLO

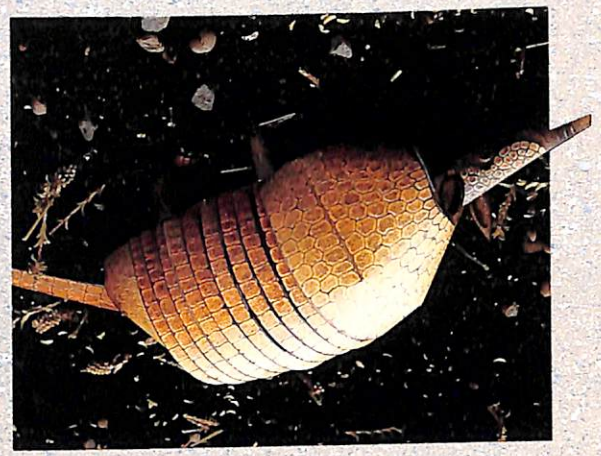
UK £1.99 IR£2.25 Aust \$4.95 NZ \$5.95 (inc. GST) Malaysia RM5.90 Sing \$5.95 Malta Lm1.75 S. Africa R8.95

FULLY
SOR

INSIDE THIS PACK

FACT FILES

- Early warning satellites
- Border patrols ► Voice
- Recognition systems
- Electronic tagging ► Nuclear
- Hi-tech bomb detectors
- Self defence
- safety

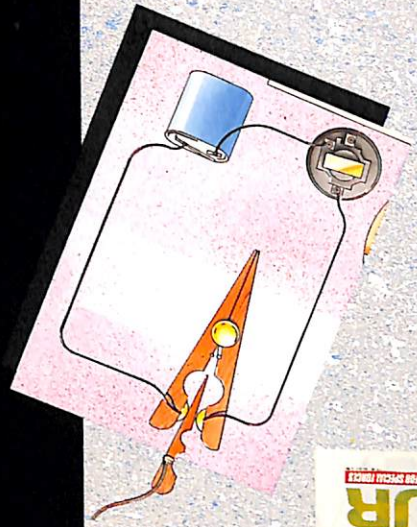


MODEL Armadillo



POSTER Body armour

THREE SCIENTIFIC PROJECTS



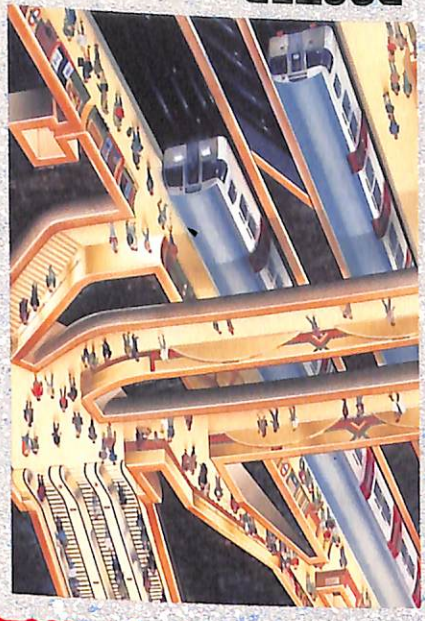
COMING IN QUEST 26 GOING UNDERGROUND

FACT FILES INCLUDE:

- Volcanoes
- Underground transport
- Precious stones
- Earthquakes
- The Earth's core
- Blasting mines



MODEL Erupting volcano

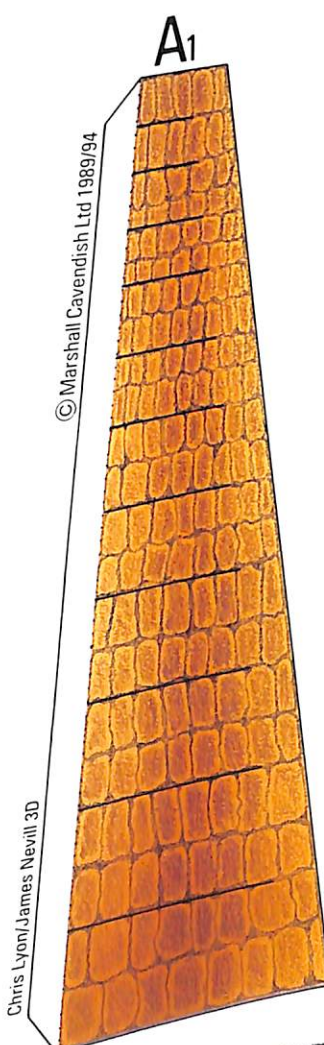
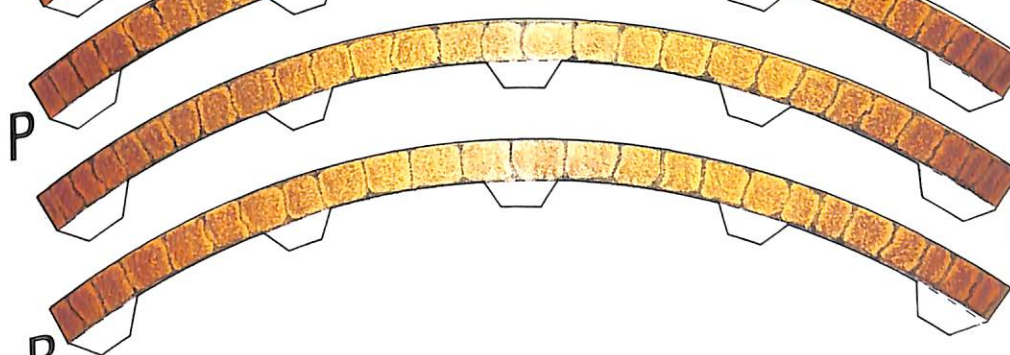
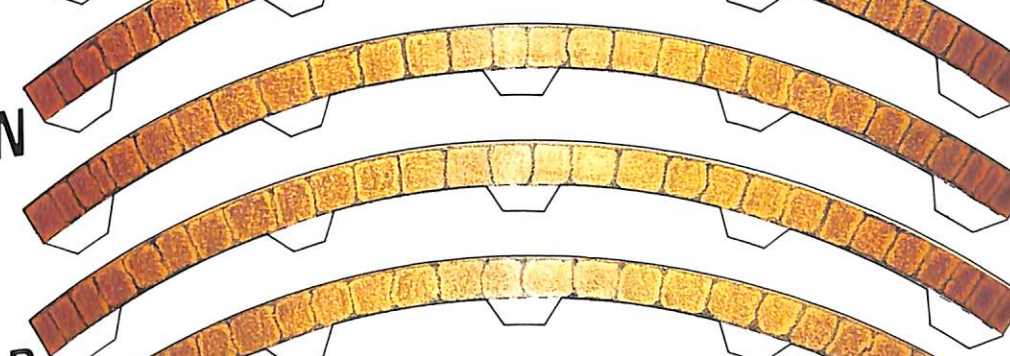
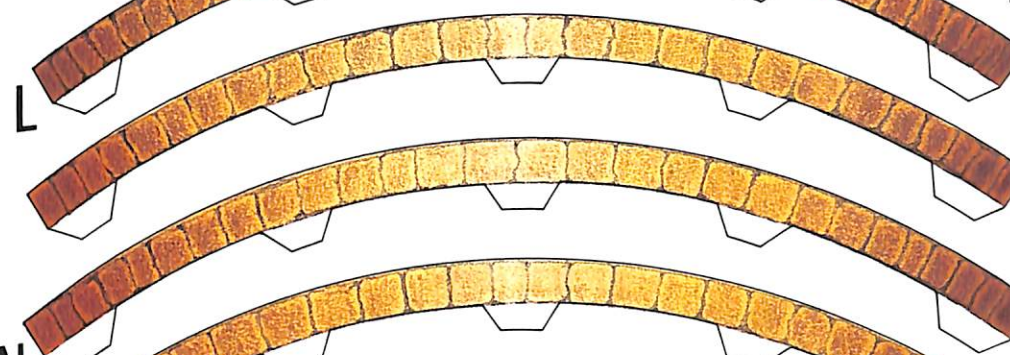
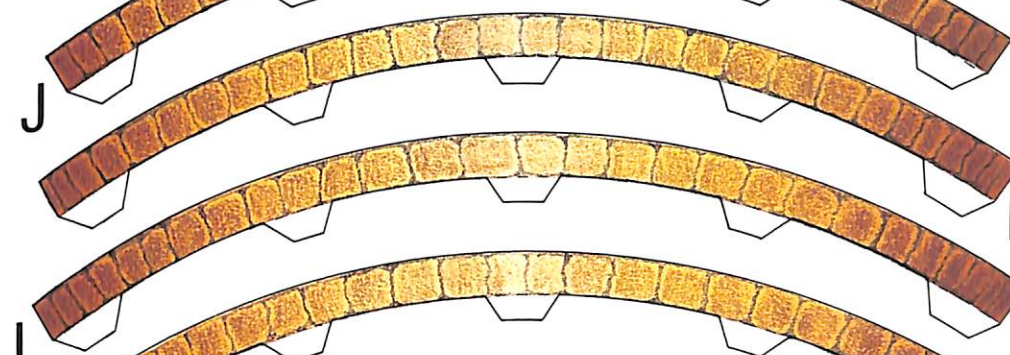
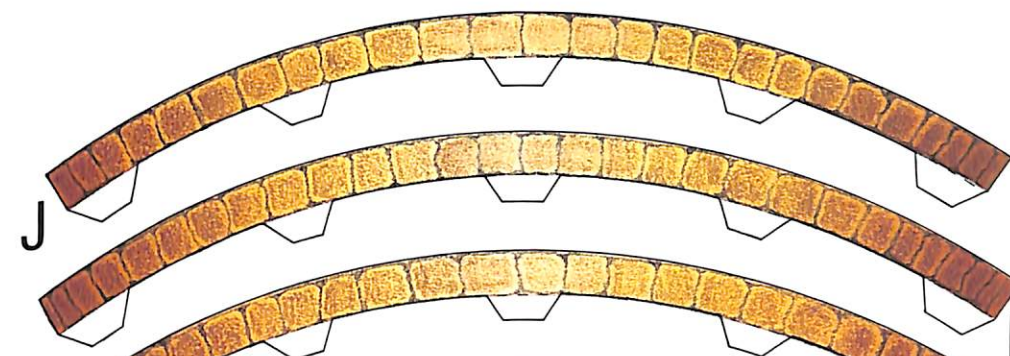
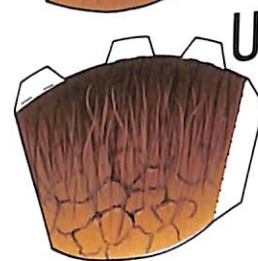
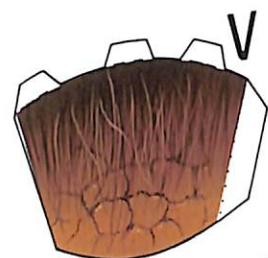
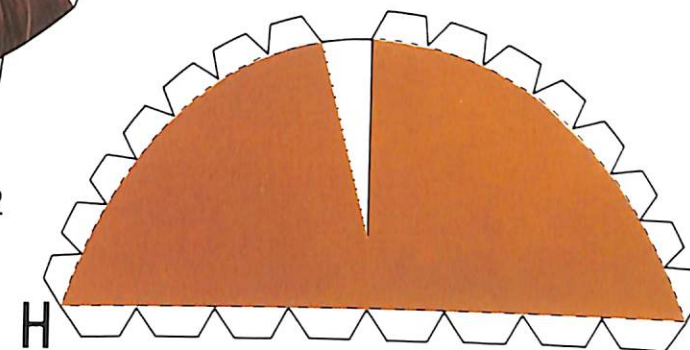
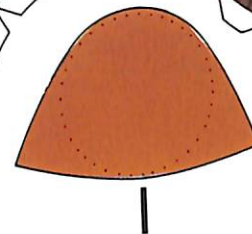
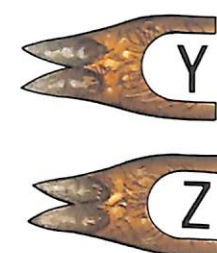
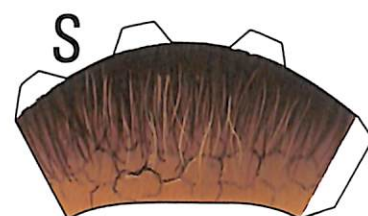
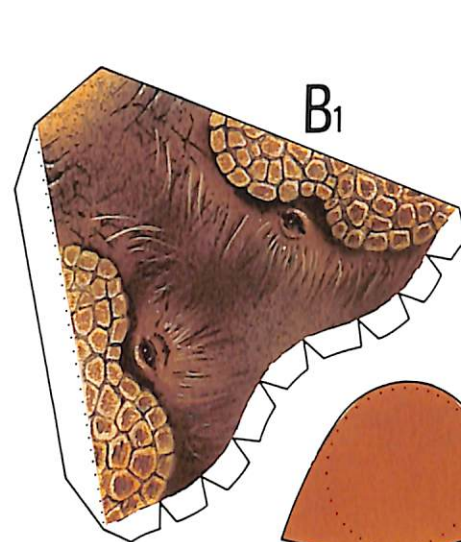
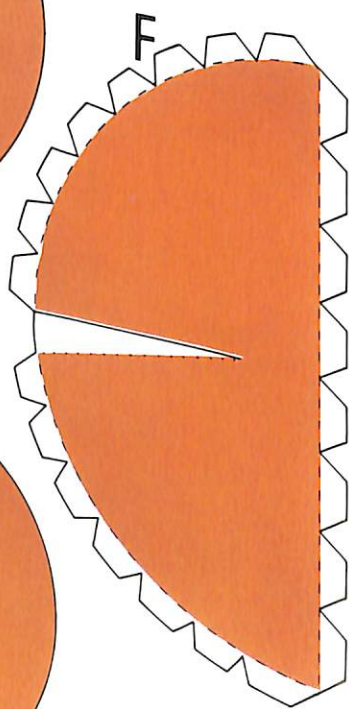
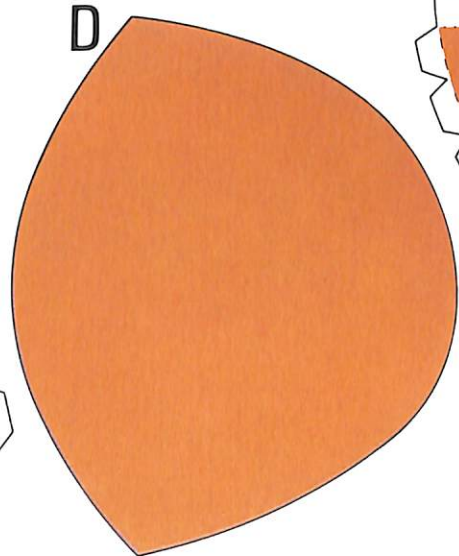
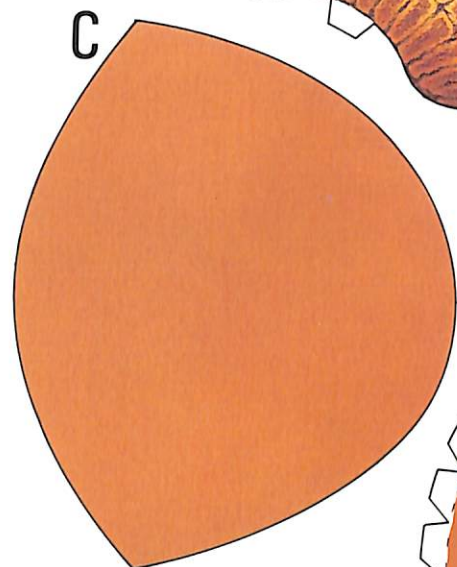
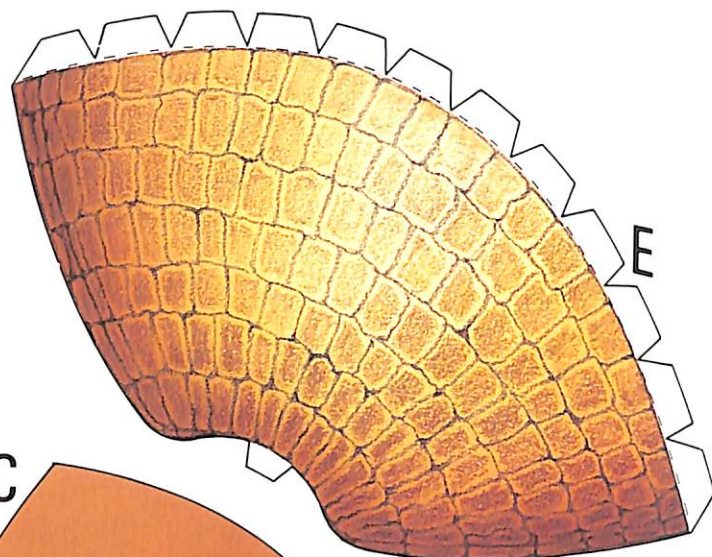
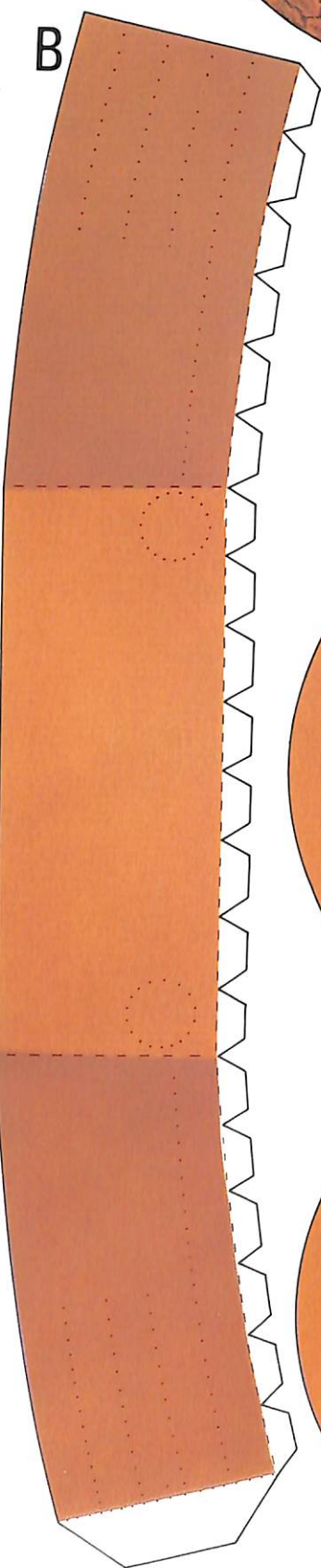
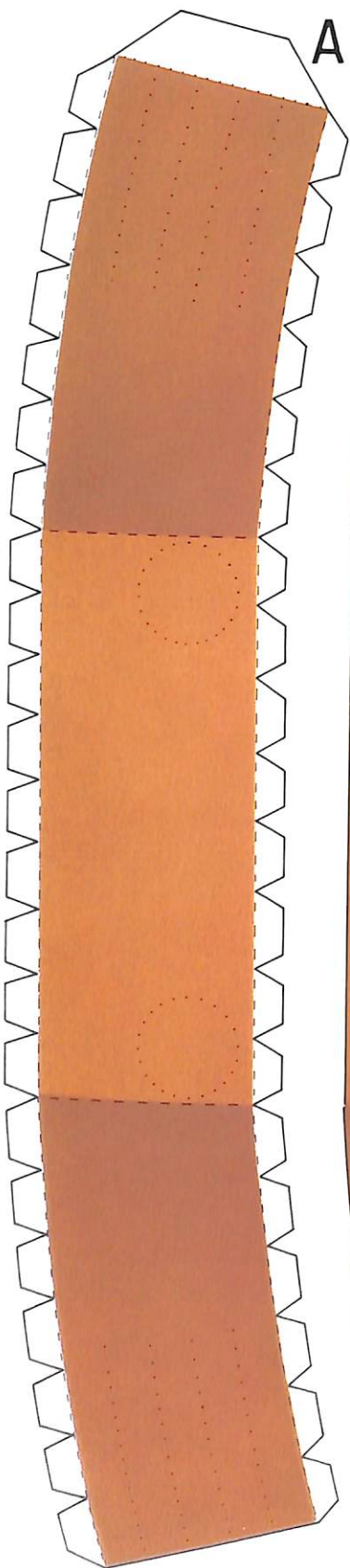
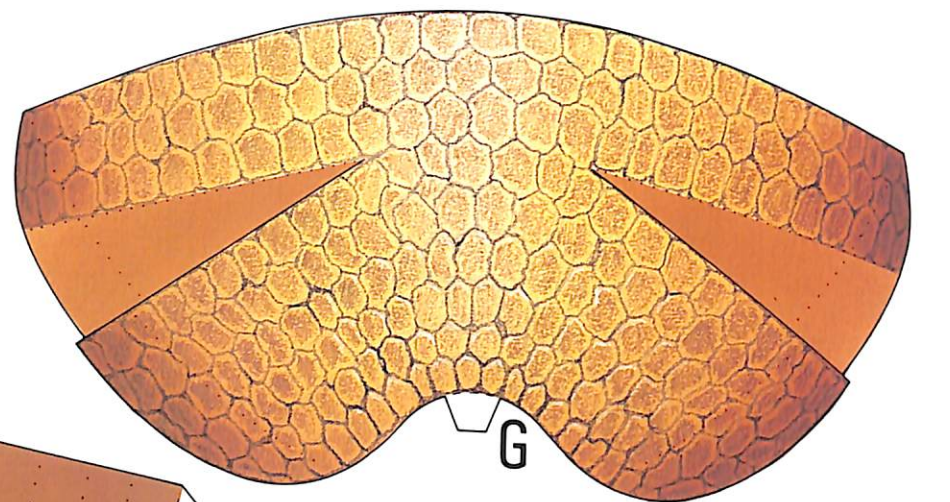


POSTER Station underground



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ARMADILLO



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Chris Lyon/James Nevill 3D



READY FOR ACTION

forces' tackle situations that ordinary army units can't handle – such as terrorists in a building or a hijacked airliner. Their job calls for sophisticated security

Special forces personnel may be called on to close quarters, so they wear armour that can stop bullets fired at close range. All modern body armour is based on the plastics Kevlar and Nomex, which are as strong as steel but weigh only one-fifth as much. The garments may be reinforced by ceramic plates. Beneath them the soldiers may wear fire-retardant suits that withstand temperatures of 1500C for one

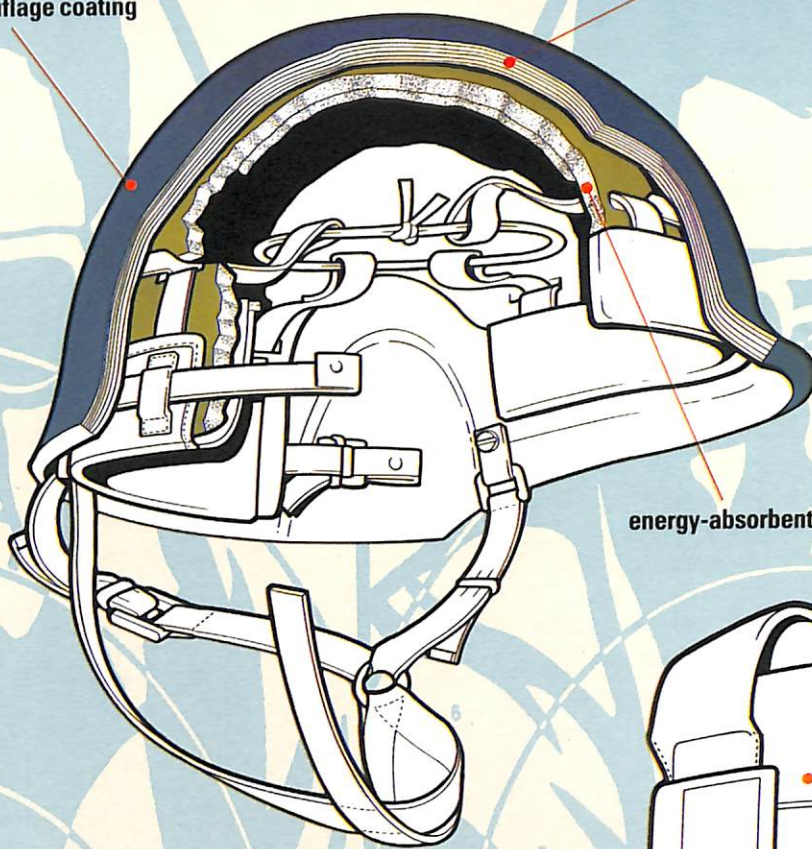
hour. An elite warrior's 'suit of armour' must also protect him from the effects of his own weapons. Grenades are an important part of the terrorist armoury. Since they do not kill they can be used where innocent lives are at risk – for example, where hostages are being held. The soldiers create a blinding 1.5 million-candlepower flash, a deafening bang, a pressure wave that winds up people not wearing protective clothing and a cloud of CS gas. The special force trooper protects himself with anti-flash goggles, electronic earplugs to shut out loud sounds and a respirator to filter out gas.

Artworks redrawn by Mark Franklin

on-off
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up the
inside

infra-red camouflage coating

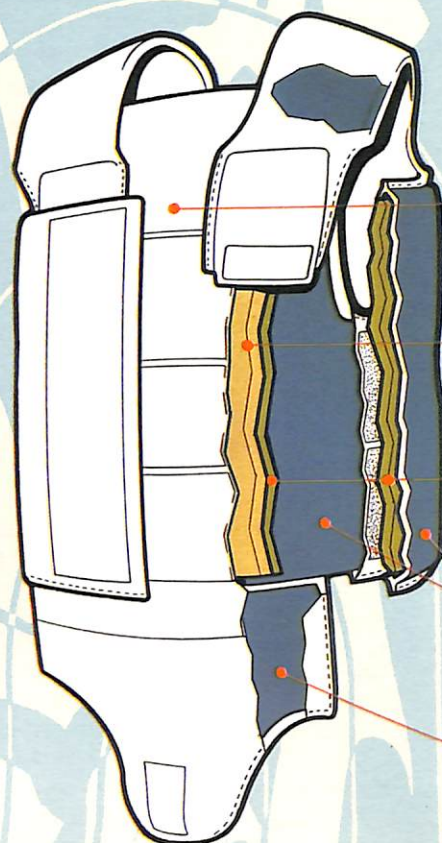
ballistic cloth layers



An advanced combat helmet has an outer structure built up of layers of Kevlar 'ballistic' cloth. This can stop a bullet or fragment weighing 1.1g travelling at 610 metres/second. Even then the impact could kill the wearer, so just as vital is the energy-absorbing liner, made of a plastic foam. The helmet is coated with paint that will not show up in the infra-red light used by certain types of rifle night-sights.

energy-absorbent liner

The bulletproof vest's first line of defence consists of contoured ceramic plates at front and back. When a bullet hits one of these, the plate may shatter but will still provide protection against a few more impacts. Underneath the plates is a trauma liner, designed to absorb the potentially lethal energy of an impact. The innermost layer is a wraparound fragmentation vest, 18mm thick, designed to stop high-speed bullets or fragments.



Velcro fasteners

ceramic plate

trauma liner

fragmentation vest

groin panel



Storming into combat. A two-man special forces team moves in to bring a terrorist crisis to an end. The leader's shield is capable of stopping a 9mm-calibre round fired from a distance of less than 1 metre. Weapons are selected for the precise conditions the assault team will meet: stun grenades, for example, have an explosive power carefully chosen for the size of the area where they will be used. The attackers may also carry specialized explosives for blowing in doors or slicing through pillars.

Background picture: Police Athletics Association, Shooting Section
All other pictures: GD Special Forces

ARMOUR

PROTECTIVE GEAR FOR SPECIAL FORCES

QUEST

combat helmet – protects against bullets, fragments and blows to the head

headset – independent earphones relay messages on the fighting team's radio and also protect their ears. They amplify faint sounds, but cut down the noise of explosions

body armour – a bulletproof vest reinforced by ceramic plates

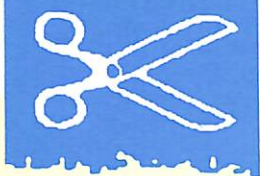
respirator – a canister mounted on either side filters out CS gas. An air cylinder carried on the back can also deliver ten minutes' air supply. Special lenses protect eyes against the flash of stun grenades

body mike – the large switch controls a boom microphone, backing up the main mike, which is in the respirator mask

flame suit – made of special, ultra-strong fireproof material. Heat-resistant pads protect elbows and knees when crawling over hot surfaces

abseil harness – for scaling walls using ropes

BODY ARMOUR



MODEL ARMADILLO

ASSEMBLY INSTRUCTIONS

You will need

Scissors • Ruler • Craft knife • Glue

Before cutting out the pieces, score along all broken lines with a blunt edge and ruler to make folding and glueing easier. Study the ASSEMBLY DIAGRAM to see how the pieces fit together, and use dotted lines as a guide for positioning.

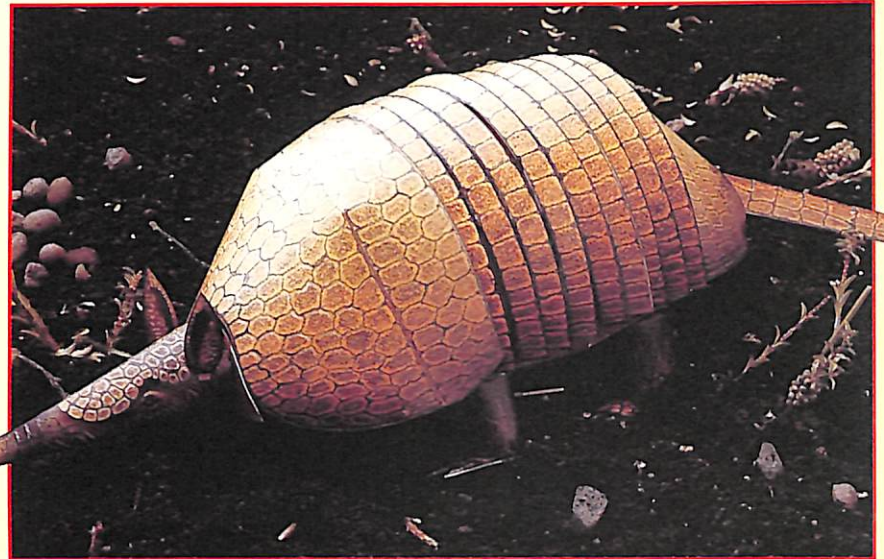
NB Younger children will need supervision when using a craft knife.

To make up Body

- 1 Cut out body section **A**. Fold slightly along dotted lines and glue into oval shape (See ASSEMBLY DIAGRAM).
- 2 Cut out body section **B**. Fold slightly along dotted lines and glue into shape as before.
- 3 When **A** and **B** are dry, glue tabs of **B** to underside of **A**.
- 4 Cut out **C**. Fold tabs of **B** and glue **C** to **B**.
- 5 Cut out **D**. Fold tabs of **A** and glue **D** to **A**.
- 6 Cut out hind armour **E**, fold tabs and glue to **C** (see ASSEMBLY DIAGRAM).
- 7 Cut out underparts **F**. Cut slit and glue into half-circle. When dry, glue tabs of **F** to **E**, leaving small hole for tail.
- 8 Cut out shoulder armour **G**. Cut slits at shoulders. Glue at slits to create curved shoulders. Leave to dry.
- 9 Glue **G** over **A** using first dotted line as positioning guide.
- 10 Cut out underpart **H**. Cut and glue slit to create slight curve. Fold tabs. Glue tabs of **H** to **D** and **G**.
- 11 Cut out **I** and glue it on to tabs of **G** and **H**.

Armour plates

NB When attaching the armadillo's armour plating, follow the positioning marks and



always glue the centre of the strip to the body first.

- 1 Cut out plate **J**. Fold tabs and glue to edge of **A** nearer to head.
- 2 Repeat with **K, L, M, N, O, P, Q, R**. Each plate should overlap very slightly.

Legs and feet

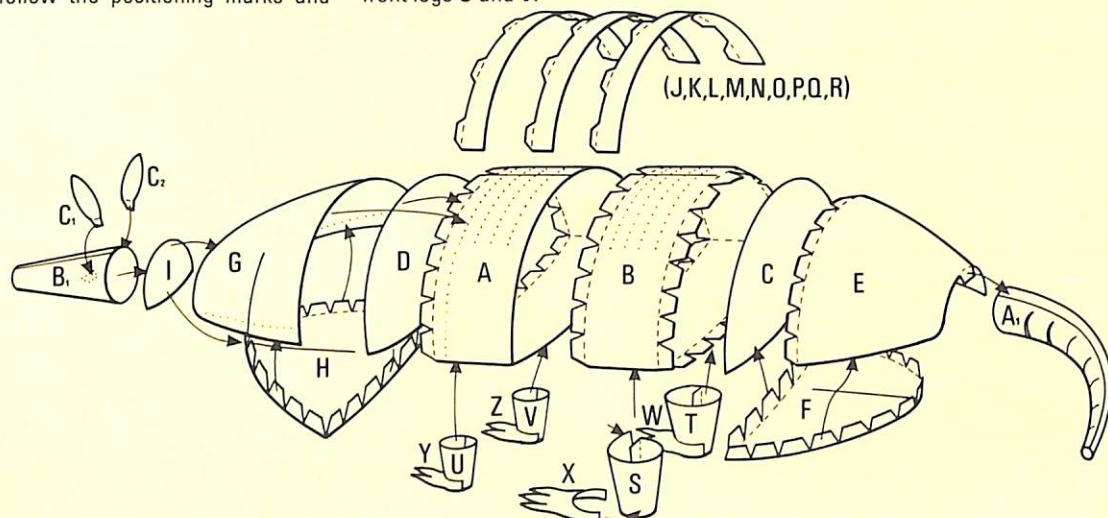
- 1 Cut out hind leg **S**. Glue into cone shape. Hold in position until glue is dry.
- 2 Repeat with other hind leg **T**.
- 3 Cut out front leg **U**. Glue into cone shape.
- 4 Repeat with other front leg **V**.
- 5 Glue **S, T, U** and **V** to underside of armadillo at positions marked with dotted circles. Make sure join marks on legs face inwards. Leave to dry.
- 6 Cut out hind feet **W** and **X** and glue them around hind legs **S** and **T**.
- 7 Cut out front feet **Y** and **Z** and glue around front legs **U** and **V**.

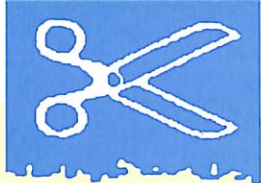
Tail

- 1 Cut out **A1** and glue into cone shape.
- 2 Cut 11 slits in tail, along marked lines, so that tail will curve.
- 3 Glue tail into hole at back end of armadillo, attaching it to tabs of **E** and **F** (see ASSEMBLY DIAGRAM).

Head

- 1 Cut out head **B1**. Fold tabs gently inwards and then glue into cone shape.
- 2 Glue tabs of head **B1** on to **I** at front end of armadillo (see ASSEMBLY DIAGRAM).
- 3 Cut out ear **C1** and fold tab. Find position for ear – it is marked on side of head with dotted lines. Attach ear to head by glueing underside of tab on to dots.
- 4 Repeat with other ear **C2**.





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4 Cut out **C**. Fold tabs of **B** and glue **C** to **B**.

5 Cut out **D**. Fold tabs of **A** and glue **D** to **A**.

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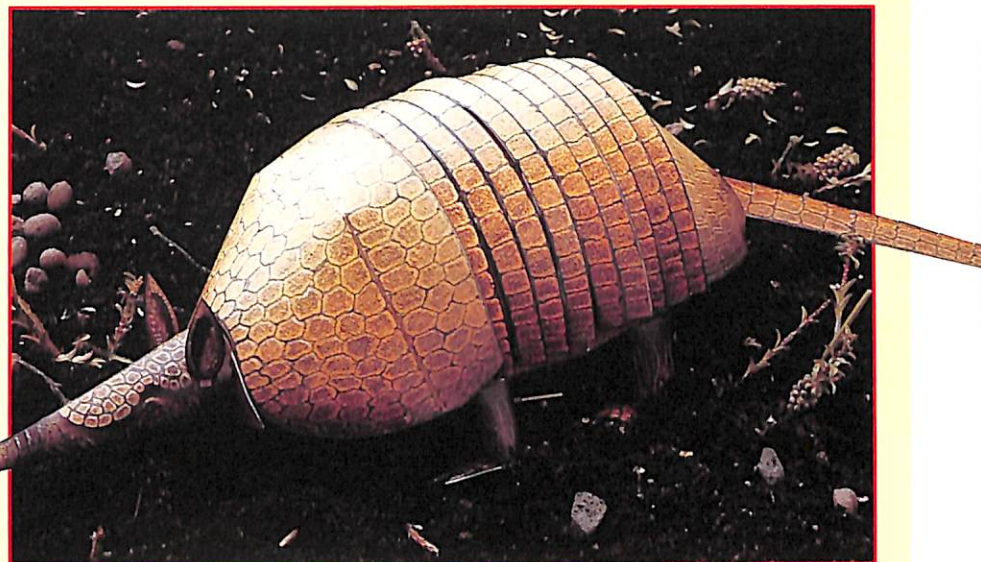
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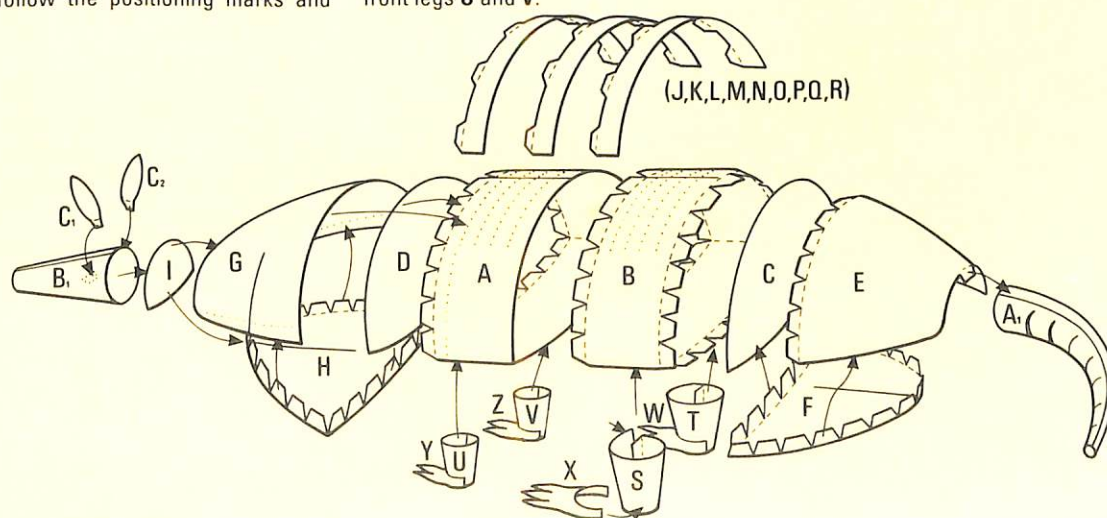
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PROJECTS SECURITY

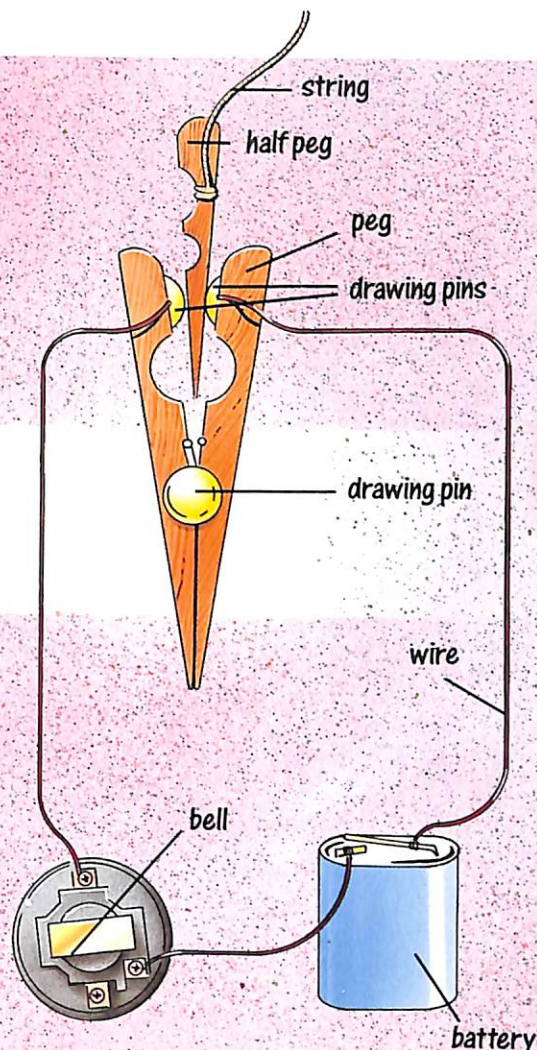
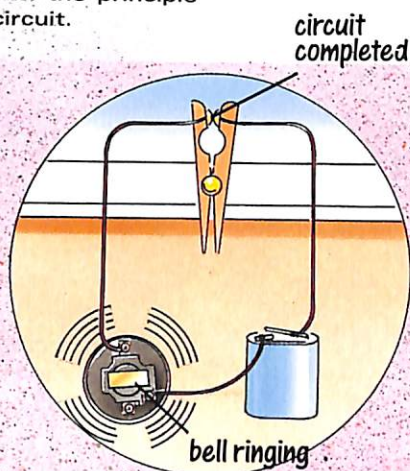
• See how you can make your own burglar alarm with some simple household items.

BURGLAR ALARM

1 2 3 4 5

All burglar alarms operate on the principle of completing an electrical circuit.

You need a piece of string, two wooden clothes pegs, three unpainted drawing pins, a battery and a battery-powered door bell. Make the alarm as shown. To use it fix the clothes peg to one side of a window or door frame with a drawing pin. Then stretch the thread tightly across the door or window and attach it to the other side of the frame. If anyone enters, the circuit will be completed and the alarm will be sounded.

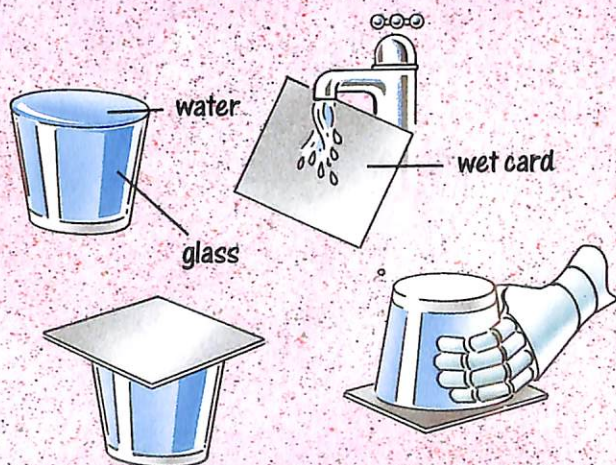


Simon Critchley

THE MAGIC CARD

1 2 3 4 5

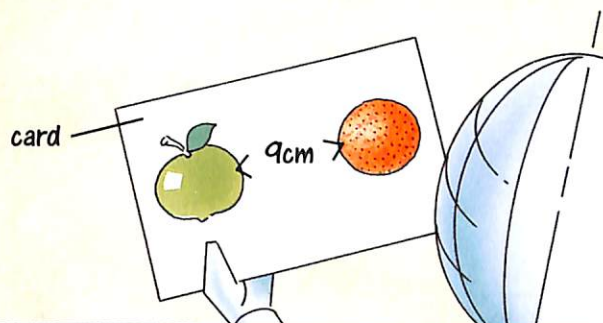
You need a glass with a smooth, round rim and a square sheet of stiff, flat card. Fill the glass with water, making sure that the surface is slightly proud of the rim. Then, wet the card under the tap and place it carefully on top of the glass. Hold the card still on the glass and carefully turn it upside down. Slowly take your hand off the cardboard. You will find that the cardboard remains stuck to the glass and the water stays inside. This is because of surface tension of the water.



FINDING YOUR BLIND SPOT

1 2 3 4 5

Draw an apple and an orange on a sheet of paper as shown, each about 1 cm across and about 9 cm apart. Hold the paper at arms length, close your left eye and stare at the apple with your right eye. You will still be able to see the orange. Now, staring at the apple, slowly bring the paper nearer towards your face. At a certain distance the orange will disappear.



PROJECT INFORMATION

1 2 3 4 5

Each QUEST project has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated

WARNING!

Every care has been taken to ensure projects are as safe as possible. However, parents should supervise all projects. The publisher can accept no liability for injury.